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Fungal herbarium EAA in Tartu (Estonia)

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Abstract: Fully databased Mycological Herbarium of the Phytopathological Research Station of the Tartu University (Estonia) was founded together with the Station by Prof. Fedor Bucholtz in 1922. According to the *PlutoF* database, 1 January 2011 in the herbarium EAA there were 23,406 fungal specimens including 8,017 mainly microfungi collected in Estonia. Most of the Estonian specimens were collected by Elmar Lepik, the Head of the Phytopathological Station from 1929–1944 (4,447 specimens).

Kokkuvõte: Seente herbaarium EAA (Tartu, Eesti)

Tartu Ülikooli endise Taimehaiguste Katsejaama (nüüd Eesti Maaülikooli Põllumajandus- ja keskkonnainstituudi) mikroseente herbaarium EAA asutati prof. Fedor Bucholtzi poolt 1922. Täielikul andmebaasistamisel selgus, et 1. jaanuaril 2011 oli selles seene-eksemplare 23 406. Neist on 8017 korjatud Eestist, sellest üle poole katsejaama juhataja Elmar Lepiku poolt aastail 1929–1944 (4447 eksemplari).

INTRODUCTION

Fedor Bucholtz, a mycologists was elected the professor in botany of the Tartu University in 1919, when the War of Estonian Independece was underway (Parmasto, 2010). His first and main tasks were to restore teaching in botany, to organize the activities of the Botanical Garden, to find and employ staff. In 1922 he founded the Phytopathological Experimental Station of the University. His personal mycological herbarium had been lost in the wartime, so he had to start from the very beginning. An herbarium of mainly microfungi collected by A. Bäumler in Austria-Hungary (mainly in Slovakia) in 1903–1912, of about 2,500 specimens was bought for the Station. After serious illness, Professor Buchotz died in 1924; his able student, Elmar Lep(p)ik completed his diploma paper on parasitic microfungi in the vicinities of Tartu. Herbarium specimens collected by him (about 950 collections) were added to the new mycological herbarium of the Phytopathological Station, situated from 1925–1944 in the Raadi manor in a suburb of Tartu. Part of the Bucholtz´ herbarium, happily not all lost, was returned from Russia to Tartu and his widow Claudia Bucholtz gave it as a generous gift to the Tartu University in 1930. From 1929 onwards Estonian fungi have been collected for the Phytopathological Station, mainly by E. Lepik, but also many other Estonian phytopathologists and botanists (including Teodor Lippmaa, Gustav Vilbaste and others). Several exsiccata and collections were bought for the Station from abroad or obtained in exchange for the fungi sent by the Station.

The first survey of the Herbarium was published by Lepik in German and Estonian (1934; see also Parmasto, 2010). His data were based on partly not yet fully inventoried collections; he concluded, that in the Herbarium there were about 2,000 specimens of Estonian fungi, 8,000 collections in the general herbarium obtained by exchange, purchase or gift, and about 5,000 unordered specimens presented by Claudia Bucholtz. Altogether, about 15,000 fungal collections were in the herbarium in 1934. Short characteristics of the herbarium (said to be about 22,000 specimens altogether) were compiled later (Kõljalg 2008: 210–211), who added some estimated data.

No other inventory of the herbarium was made; no documents or correspondence on the new collections or their fate are present in the Estonian archives (T. Shor, *in litt.*). Neither a "logbook" nor regular reports were kept during the 90 years of the Herbarium history. Moreover, we do not know what happened with the collections in wartime. On 5 September 1944 the Experimental Station and Herbarium building felled into ruins. There are no files in the Estonian State Archives regarding the re-evacuation

after the war of the University properties and war damages and there is nothing about the Phytopathological Station and its properties (T. Shor, *in litt.*).

In 2004, thanks to the five-year Estonian state programme "Collections of Humanities and Natural Sciences" (2004–2008), electronic databasing of the Estonian mycological herbaria began. In the beginning Colwell´s program Biota was used for data input, later Erast Parmasto and Aavo Kuslapuu transferred the data into the general database of Estonian biological collections PlutoF (Abarenkov et al., 2010; http://elurikkus.ut.ee/plutof.php?lang=eng). Thanks to the efforts of Ph.D. Anne-Liis Sõmermaa, biology students Ede Leppik and Irma Zetter, the collection is now fully databased and available for species search via the internet in Estonian as well as in English: http://elurikkus.ut.ee/index.php?lang=eng

The data retrieved from the PlutoF database by Kessy Abarenkov enabled us to describe not only the present state of the collection, but also several details of its history.

NUMBER OF SPECIMENS

According to the PlutoF database, 1 January 2011 in the herbarium EAA there were 23,051 fungal specimens. Three fascicles of exsiccata have been deposited to the herbarium of the same Institute TAAM (former herbarium of the Institute of Zoology and Botany of the Estonian Academy of Sciences); altogether, the number of collections is 23,406.

There were about 2,600 specimens from Estonia in the Herbarium in 1934 (Lepik, 1934-a), now there are 8,017. However, some part of collections, mainly duplicates, have possibly been lost during wartime, when the building in Raadi with the herbarium was destroyed in 1944. 611 collections were made by prof. Fedor Bucholtz, mainly before 1917 and joined to the Herbarium after re-evacuated from Russia (possibly in 1924 or 1925). Most of the Estonian specimens have been collected by Elmar Lepik, the Head of the Phytopathological Station in 1929–1944 (4,447 specimens). Anne-Liis Sõmermaa, Associate Professor, but also the Supervisor of the herbarium in 1977–2011 has collected 850 specimens; Kaljo Kivi, the Head of the Institute in 1970–1975 – 249; an amateur mycologist, agaricologist Nikolai Witkovsky – 524.

DYNAMICS OF COLLECTING

In first years (until 1923) main attention has been paid obtaining exsiccata and herbarium specimens from other countries – to make it possible to identify freshly collected or sent by farmers parasitic microfungi. The oldest collection has been made in 1852 by Ferdinand Wiedeman, an Estonian linguist (*Puccinia passerini* on *Thesium ebracteatum,* identified by Lepik). First bigger collection was made by E. Lepik for his M. Sc. paper: in 1924–1925 about 930 specimens have been collected by him near Tartu. Until his returning from Zürich in 1929, 1,960 Estonian specimens of the herbarium have been collected. Of the 4,450 specimens of Estonian fungi, collected in 1929–1942, 2,980 (two thirds) were collected by Lepik. During the next 14 years, only 38 Estonian specimens were added to the Herbarium by all collectors; no collections at all in 1944, 1946, 1948–1950, 1954. In 1958 and 1959 a graduate student Kaljo Kivi collected 230 specimens of parasitic fungi on cultivated leguminous plants. Since 1977, but mainly in 1979–1982 and 1997–2002 Associate Professor Anne-Liis Sõmermaa collected 850 specimens, mainly of parasitic fungi of cultivated plants. During the period 1944–2010 (67 years), altogether1360 fungal specimens collected in Estonia have been added to the EAA.

REGIONS OF COLLECTING

Of the 15 counties of Estonia, only in three more than 250 specimens have been collected and kept in EAA during the last ninety years: 4862 from Tartu town and county, 577 from Harju Co. and Tallinn, and 740 from Saare Co. (Saaremaa Is.). In the mycological herbarium of the Tallinn Botanical Garden (TALL), additional 1644 specimens from Harju Co. and Tallinn, 499 from Lääne Co. and 570 from Tartu Co. has been collected. Several counties have been left almost without any attention: Hiiu Co. (EAA 18 and TALL 4 specimens, 22 altogether), Võru Co. (63 + 19 = 82), Järva Co. (54 + 53 = 107), Valga Co. (66 + 95 = 161 specimens).

EXSICCATA

More than a half, maybe even up to two third of collections have been received in exchange with other herbaria or bought. Already Bucholtz ob-

tained a big collection of mainly Slovakian fungi from A. Bäumler (about 2500 specimens according to Lepik, 1934; 2488 specimens databased now). The exsiccata, usually as uncomplete sets were received in exchange with E. Lepik´s Fungi Estonici Exsiccati (1–6, 1931–1942, altogether 300 nos.) and Bucholtz´ and Bondarzew´s Fungi Rossici Exsiccati (1–4, 11–14, 1915–1918, altogether 400 nos.). Almost all fungi obtained were not kept in original fascicles of exsiccati but have been separated and scattered into Herbarium Generale according to Saccardo´s system. It was in accordance with the general strategy of the collection stucture: it was not so much a herbarium for compiling taxonomical papers but a reference herbarium to help in identification of new specimens.

Altogether 17 different exsiccata with 5,672 specimens have been obtained. Nine of these contain more than 50 numbers (specimens):

J. Smarods, Fungi latvici exsiccati. Riga, 1368 nos. (specimens).
Sydow, Mycotheca Germanica. Berlin, 1137.
Kryptogamae exsiccatae editae a Museo Palatino Vindobonensi. Wien [Vienna], 774.
Schroeter, Pilze Schlesiens, 234.
Savulescu, Herbarium mycologicum Romanicum. Bucuresti [Bucharest], 290.
Passauer, Cryptogamae exsiccatae editae a Museo Historiae Naturalis Vindobonensi. Wien [Vienna], 218.
Bontea & Constantinescu, Herbarium mycologicum Romanicum. Academia Republicii Socialiste Romania, Institutul de Biologie Tr. Savulescu. Bucuresti [Bucharest], 211.
Cryptogamae Cechoslovenicae exsiccatae, editae ab Instituto Botanico Polytechnici Pragense, curantibus Prof. Dr. K. Kavina et Doc. Dr. A. Hilitzer. Prague, 118.
Jaczewski, Komarov & Tranzschel, Fungi Rossiae exsiccati. St. Petersburg [Sankt Peterburg], 60.

BIBLIOTHECA

A bibliotheca of good mycological handbooks and periodicals has been made up in 1920s and 1930s. Due to the political loyalty, but also courage of prof. Marland, it was one of the very few institutes of Tartu State University where foreign (incl. German) books were neither destroyed nor passed to the special fonds of banned literature in the beginning of 1950s by the Soviet censors. Of the important periodicals, some may be mentioned here:

Annales Mycologici (Berlin; 20, 1922, – 44, 1943).
Bibliographie der Pflanzenschutz-literatur (Berlin, 1921 – 1942).
Biological Abstracts (Philadelphia; 1, 1927 – 15, 1941).
Bulletin trimestriel de la Société mycologique de France (Paris; 41, 1925 – 53, 1939).
Jahresbericht über das Gebiet der Pflanzenkrankheiten (Berlin; 1, 1898 – 16, 1913).
Mycologia (New York; 1, 1909 – 31, 1939)
Phytopathologische Zeitschrift (Berlin; 1, 1930 – 14, 1943).
Supplement to Phytopathology (Lancaster; 1920 – 1940).
The Review of applied mycology (8, 1929 – 18, 1939).
Revue de Mycologie (Paris; 1, 1936 – 4, 1939).
Zeitschrift für Pflanzenkrankheiten (Stuttgart; 1, 1891 – 13, 1923).

FUTURE OF THE COLLECTION(S)

In the Institute of Agricultural and Environmental Sciences, there are two fungal herbaria: EAA (founded in 1922 at the Phytopathological Experimental Station of the Tartu University) and TAAM (founded in 1950 at the Institute of Biology of the Estonian SSR Academy of Sciences). Last decades, the activities of these herbaria have been well coordinated, including similar on-line databasing using the same format. Obviously, the herbaria will be joined in near future – if not physically, then anyway administratively under care of the same chief curator. Until recently the herbaria were almost not used in identification of microfungi found as new for Estonia. Popular textbooks on plant protection have been translated into Estonian sometimes without checking the presence or absence of some fungal species here. Hopefully recently ordered and fully databased herbarium of microfungi EAA will be used avtively in this task.

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